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Abstract:

Capabilities, Calibration, and Impact of the ISS-RAD Fast Neutron Detector

In the current NASA crew radiation health risk assessment framework, estimates for the neutron contributions to crew radiation exposure largely rely on simulated data with sizeable uncertainties due to the lack of experimental measurements inside the ISS. Integrated in the ISS-RAD instrument, the ISS-RAD Fast Neutron Detector (FND) will deploy to the ISS on one of the next cargo supply missions. Together with the ISS-RAD Charged Particle Detector, the FND will perform, for the first time, routine and precise direct neutron measurements inside the ISS between 0.5 and 80 MeV. The measurements will close the NASA Medical Operations Requirement to monitor neutrons inside the ISS and impact crew radiation health risk assessments by reducing uncertainties on the neutron contribution to crew exposure, enabling more efficient mission planning. The presentation will focus on the FND detection mechanism, calibration results and expectations about the FND's interaction with the mixed radiation field inside the ISS.